

DECLARATION OF DR. BALA DHANDAPANI

I, Bala Dhandapani, residing at 30 Marion Circle, Eastampton, NJ 08060, declare and state that:

1. I received a Bachelor of Science Degree in Chemical Engineering from Anna University, Madras, India. I received a Doctorate Degree in Chemical Engineering in 1993 and a Masters of Science Degree in Chemical Engineering in 1990 from the Clarkson University, Potsdam, NY.

2. From 1997 to present, I have been employed as a Project Manager at BlackLight Power Inc., Cranbury, NJ, where I manage and conduct synthesis and characterization of novel hydride compounds.

3. From 1994-1997, I was employed as a Postdoctoral Research Associate and Laboratory Coordinator at Virginia Tech, Blacksburg, VA, Environmental Catalysis and Materials Laboratory, where I conducted synthesis, characterization, testing and development of novel catalytic materials for various environmentally significant reactions. I also managed the research activities of the lab of 12 researchers, including doctoral, masters and undergraduate students.

4. From 1990 - 1993, I was employed as a Research Assistant at Clarkson University, Potsdam, NY, wherein I studied the application of foam and monolith substrates for environmental catalysis. I also designed and constructed a reactor system with advanced instrumentation.

5. From 1988-1990, I was employed as an Instructor/Teaching Assistant at Clarkson University, where I taught the following courses: Unit Operations Laboratory, Reaction Engineering and Analysis, Advanced Reactor Design, Heterogeneous Catalysis, Material Science and Corrosion Engineering Laboratory.

6. I am experienced on the following instrumentation: AMETEK Quad Mass Spectrometer; Varian 3700 Gas Chromatograph; ISI-40 Scanning Electron Microscope; Siemens D 500 X-ray Diffractometer; Micromeritics ASAP 2010 Chemi; CHNS-EA1180 Elemental Analyzer; Perkin Elmer PHI 5300 ESCA; BioRad FT-60 Infrared spectroscopy; Mariner ESI-ToF Mass Spectrometer; HP 5890 and 6890 Gas Chromatograph; HP1100 HPLC; and Kratos XSAM800 XPS.

7. My research experience includes the synthesis of novel materials including: high surface area catalytic materials including monometallic and bimetallic transition metal carbides, nitrides, phosphides, hydrides and sulfides; noble metals and transition metal oxides; active catalytic materials supported on alumina, activated carbon, silica and titania; and high surface area activated carbon and silica from various precursors.

8. My research experience also includes the characterization of materials using the following techniques: X-ray diffraction; X-ray photoelectron spectroscopy; FTIR spectroscopy; Electrospray Ionization Time of Flight Mass Spectroscopy; Time of Flight Secondary Ion Mass Spectroscopy; Solids Probe Mass Spectroscopy (Quadrupole,

Magnetic Sector and Time of Flight); Proton Nuclear Magnetic Resonance; Scanning Electron Microscopy; Physisorption and Chemisorption techniques; Temperature programmed experiments; and Conductivity measurements Inductively Coupled Plasma Mass Spectrometry (elemental analysis).

9. My research experience further includes the development of catalytic materials, including: Optimization of synthesis conditions; Inclusion of additives, stabilizers and binders; and Fabrication of catalysts on monolith and foam substrates.

10. My research experience further includes the testing and evaluation of catalysts, including: Ozone decomposition reaction; Hydrogenation of aromatic compounds; Hydrodenitrogenation (HDN), hydrodesulfurization (HDS), hydrodeoxygenation (HDO) of various model compounds at high pressure reaction conditions; Hydrodechlorination (HDC) of chlorofluorocarbons; and Reforming of methane using membrane and plug flow reactors.

11. My research experience further includes kinetics and mechanism, including: Catalytic ozone decomposition reaction; Hydrogenation of isopropyl benzene; Simultaneous HDN, HDS and HDO of various heterocyclic aromatic compounds; and Hydrodechlorination of CFC-12 to HCFC-22 and HFC-32.

12. A selected list of my publications is attached.

13. I supervised the preparation of the compounds shown in the following Tables 1 and 2. Table 1 includes new compounds comprising hydrinos formed using catalysts for forming hydrinos (lower energy hydrogen) from hydrogen. The process used for forming the compounds comprising hydrinos is described in Dr. Randell L. Mills U.S. serial No. 09/009,294 and published PCT/US98/14029 application. Table 2 includes control compounds comprising conventional elements and energy states.

14. Blind samples of the compounds were sent to Dr. Gary L. Turner of Spectral Data Services, Inc. to conduct Nuclear-Magnetic-Resonance (NMR) evaluation of the samples. The results of the NMR analysis is shown in the Tables 1 and 2.

Summary of new hydrino hydride compounds that showed novel features with solid state MAS ^1H NMR spectroscopy

Table 1

Compound	Data file	Reactants	^1H NMR Features
KHI	blps00as.14	KI, K, H_2	-2.5*, 1.1
KHI	blps0095.005	K, KI, H_2	-3.2*, 0.9
KHCl	bpls99as.078	K, KCl, H_2	-4.4*, 4, 1.1
KHBr	bpls99as.058	K, KBr, H_2	-4.1*, 5.9, 4.3, 1.2
RbHF	bpls99as.034	RbF, K, H_2	-4.4*, 1.2

* novel features

SELECTED PUBLICATIONS

J. Y. Wang, B. Dhandapani, D-T. Chin, An Experimental Study of Mass Transfer in Pulse Reversal Plating, *Journal of Applied Electrochemistry*, 22, 240, 1992.

D-T. Chin and B. Dhandapani, An Experimental Study of Metal Distribution in Pulse Plating, *Electrochimica Acta*, 37, 1927, 1992.

B. Dhandapani and S. T. Oyama, Novel Catalysts for Selective Dehalogenation of CCl₂F₂ (CFC-12), *Catal. Lett.*, 35, 353, 1995.

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B. Dhandapani and S. T. Oyama, Gas Phase Ozone Decomposition Catalysts, *Applied Catalysis: Environmental*, 11, 129, 1997.

C. C. Yu, S. Ramanathan, B. Dhandapani, J. G. Chen and S. T. Oyama, Bimetallic Nb-Mo Hydroprocessing Catalysts: Synthesis, Characterization and Activity Studies, *J. Phys. Chem.*, 101, 512, 1997.

J. Wen, B. Dhandapani, S. T. Oyama and G. L. Wilkes, Preparation of Highly Porous Silica Gel from Poly(tetra methylene oxide) (PTMO)/Silica Hybrids, *Chem. Mater.*, 9, 1968, 1997.

B. Dhandapani, S. Ramanathan, C. C. Yu, J. G. Chen and S. T. Oyama, Synthesis, Characterization and Reactivity Studies of Supported Mo₂C with Phosphorus Additive, *J. Catal.*, 176, 1998.

B. Dhandapani, T. P. St.Clair and S. T. Oyama, Simultaneous Hydrodesulfurization, Hydrodeoxygenation and Hydrogenation with Molybdenum Carbide, *Applied Catalysis, A: General*, 168, 219, 1998.

Wei Li, B. Dhandapani and S. T. Oyama, Preparation and Characterization of Molybdenum Phosphide: A Novel Catalyst for Hydrodenitrogenation, *Chem. Lett.*, 207, 1998.

T. P. St.Clair, B. Dhandapani and S. T. Oyama, Cumene Hydrogenation Turnover Rates on Molybdenum Carbide: CO and O₂ as Probes of the Active Sites: *Catal. Lett.*, 58, 169, 1999.

P. A. Clark, B. Dhandapani and S. T. Oyama, Preparation and hydrodenitrogenation performance of Rhenium Nitride, *Applied Catalysis, A: General*, 184, L 175, 1999.

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B. Dhandapani, S. Ramanathan, C. C. Yu and S. T. Oyama, Study of Supported Bimetallic Oxycarbide Catalysts, submitted to Applied Catalysis.

B. Dhandapani, N. Greenig, J. He and R. Mills, Synthesis and Characterization of Novel Alkali Metal Halide Hydrides, submitted for publication, The International Journal of Hydrogen Energy.

B. Dhandapani, Wei Li and S. T. Oyama, Ozone Decomposition on Noble Metals and Metal Oxides, manuscript under preparation.

D-T. Chin, B. Dhandapani, J. Y. Wang, Mass Transfer in Pulse Reversal Plating, 42 nd ISE Meeting, Aug. 1991, Montreux, Switzerland.

B. Dhandapani and D-T. Chin, Experimental Study of Metal Distribution in Pulse Plating, , AIChE National Meeting, Nov. 1992, Miami, Florida.

B. Dhandapani, S. Ramanathan, C. C. Yu and S. T. Oyama, Hydrotreatment Reactions on Novel Carbide Catalysts, Tri-State Catalyst Club Symposium on Heterogeneous and Homogeneous Catalysis, May 1996, Charleston, WV.

B. Dhandapani, T. P. St.Clair and S. T. Oyama, Simultaneous Removal of Aromatics, Sulfur and Oxygen Compounds using Novel Carbide Catalysts, 212 th ACS National Meeting, August 1996, Orlando, Florida, USA.

B. Dhandapani, J. He and R. Mills, Synthesis and Characterization of Novel Hydrides, 45 th ACS, Western Regional Meeting, Oct 1999, Ontario, California, USA.

B. Dhandapani, N. Greenig, J. He and R. Mills, Novel Alkaline and Alkaline Earth Hydrides, National Hydrogen Association, February 2000, Vienna, Virginia, USA.

B. Dhandapani, M. Nansteel, J. He and R. Mills, Novel Inorganic Hydrides, ACS National Meeting, March 2000, San Francisco, California, USA.